59.205
A36
set

MARYLAND FISHERIES

PUBLISHED BY CONSERVATION DEPARTMENT OF MARYLAND

No. 7 BALTIMORE, MARYLAND NOVEMBER, 1930

CONTENTS

	Page
EQUAL FISHERY RIGHTS FOR POTOMAC	1
TANGIER SOUND OYSTER-ROCK INSPECTION	5
PROPOSED CHANGES IN FISH-LINE STAKES IN VIRGINIA WATERS	7
FACTORS AFFECTING THE MARKET FOR FRESH OYSTERS AND RELATED CONSIDERATIONS IN FOURTEEN CITIES OF THE UNITED STATES	14
SAVING YOUNG GROWTH ON SHELLS	12
THE SEED-OYSTER QUESTION	16
BIG POOL	18
FAIRLEE BASS STATION	20

EDITORIALS

THE POTOMAC RIVER PROBLEM	10
SAVING THE SPAT	11
CAUTION TO HUNTERS	11

Equal Fishery Rights for Potomac

Uniform Regulations Advocated for Citizens of Maryland and Virginia

HOW MANY PEOPLE of our State know of the inequities imposed upon the fisherman of this State by the unlooked for effects resulting from the enactments of laws covering fishing in the waters of the Potomac River?

By inequities, we mean the restrictions self-imposed by the laws of Maryland as compared with the rights enjoyed by the citizens of Virginia under the Concurrent Law on the Potomac River. These differences arise not from any intention on the part of the Legislature but from the conservation measures proposed by the citizens of Charles and St. Mary's Counties, in some cases, and by other agencies in others, and overlooking the necessity to legislate separately for the Potomac River, if intended to operate alike on the citizens of both states.

It is felt that as soon as the Legislature's attention has been called to some of the facts to be herein set forth, that it will not hesitate to see the injustice of it all and either correct its own laws or insist upon Virginia placing the same restrictions on her citizens.

Some of the laws referred to are found in the 1888 Code of Public Local Laws of Charles County, Article 9, Sections 67 and 77, and in the 1888 Code of Public Local Laws of St. Mary's County, Article 19, Section 45. These laws, at the time they were enacted, were real conservation measures, but they were not reckoned with in 1912, when the first concurrent legislation governing the rights of fisheries was enacted by the States of Maryland and Virginia.

Although Maryland owns the waters and bottoms of the Potomac River, under the Compact of 1785, entered into by the two states, Virginia was given the free right of fisheries. From that time until 1912, there was no legislation other than the laws of each state to regulate the fisheries on these waters.

The first section under Chapter 4, of the Acts of 1912, provided as follows: "It shall be lawful for any citizen of the State of Maryland or of the State of Virginia to take fish, oysters or crabs from the Potomac River after complying with the requirements of the laws of the state of which he is a citizen for the taking of fish, oysters, or crabs from the waters of such state."

If the citizens of Charles and St. Mary's Counties had then taken stock of what this meant in regard to their previous legislation, the differences, no doubt, would have been adjusted before this, but, as a matter of fact, the citizens of these counties now find themselves restricted by their own local laws without the same restrictions on the part of the citizens of Virginia. For instance: One of the restrictions imposed by Charles County upon the citizens, not only of their county but of the State, is that no person shall haul a seine more than 160 fathoms in length in the Potomac River between Maryland Point in Charles County and Cheseldine Island in St. Mary's County, except from the 15th day of March to the 1st day of June, inclusive. Virginia, on the other hand, not having passed any laws restricting her own citizens, could use any size haul-seine at any time in any waters of the Potomac River.

Section 77 also provides that it shall be unlawful for any citizen of Maryland to place a pound-net or any fishing apparatus of like description near the mouth of any tributary of the Potomac River between said points. Virginia, on the other hand, has placed no restriction upon her citizens in this respect.

The same condition exists in St. Mary's County, where its laws make it unlawful to haul a seine of greater length than 80 fathoms within a mile of the Maryland shore in that portion of the Potomac River between Cobb's Point in Charles County, and Point Lookout in St. Mary's County, except between the 15th day of March and the 15th day of May, inclusive. The shad season does not end until May 31. Virginia has placed no such restrictions upon her citizens.

Nor are the local laws of the two above-named counties the only cause of this situation. The laws governing the purse-net fishing and the regulation of the sizes of commercial fish to be

caught are State-wide measures and we find just as much conflict in the rights enjoyed by citizens of each state as we do in the sizes of nets and where they are to be placed and regulated by the laws already referred to. The purse-net laws of Maryland prohibit:

1. The catching of any fish other than food fish in the waters of the State, which includes the Potomac River as well as the Bay.

2. None but residents of Maryland are entitled to fish with purse-nets in this State.

3. Purse-nets are not permitted in any tributary waters of the Chesapeake Bay, which necessarily includes the Potomac River.

What do we find on the Virginia side of the ledger?

The right to fish with purse-nets for menhaden fish for the purpose of manufacturing same into fertilizer, etc., and no prohibition against their steamers entering the waters of the Potomac River. The very fact that they may enter into the waters of the Potomac River, for the purpose of fishing, creates a menace, as they have been found fishing in the waters of the Bay above the Maryland line.

The State-wide law, as to the sizes of fish, is uniform throughout the State. Now notice the comparison with those laws of Virginia on the same fish. Our laws prohibit the catching, selling or offering to sell, exposure for sale, or having in possession any striped bass less than 12 inches in length or weighing more than 15 pounds. The Virginia laws prohibit only the catching of rock fish when they are less than 10 inches in length and does not limit them as to weight. The situation may easily arise where a citizen of Maryland and a citizen of Virginia may fish their pound-nets side by side and if a citizen of Maryland should catch a rock less than 12 inches or weighing more than 15 pounds, he must throw it overboard or be subjected to a fine, while the Virginian may catch them of any size, provided they are not less than 10 inches in length.

The Maryland law prohibits the catching of any sturgeon weighing less than 20 pounds, while the Virginia law prohibits the catching of any less than five feet in length. On the black bass, the Maryland size is 10 inches, while in Virginia it is eight inches. The perch sizes are the same for both states.

It may be argued that all the laws are superseded by the Concurrent Law enacted by the two states. This, no doubt, is true in so far as it goes, but the trouble is that the Concurrent Law is silent on the restrictions referred to herein.

On the contrary, the Concurrent Law, as quoted above, seems to have recognized the possibility of inconsistencies, as to licenses and other regulations, as it provides that any citizen of either

state shall have the right to fish, oyster, or crab, provided he complies with the rules of the laws of the state of which he is a citizen.

From the opinions of the former Attorney-Generals of the State, it appears that the local laws of Charles and St. Mary's Counties superseded the other State laws on the subject of regulating fishing on the waters of the bordering counties and the opinions infer further that Maryland could restrict her own citizens without restricting the citizens of Virginia, under the provisions of the present Concurrent Law. This would, no doubt, apply with equal effect under the State-wide laws. As former Attorney-General Alexander Armstrong said in one of his opinions: "There is unquestionably a demand for a complete clarification and revision of these various laws relating to fishing in the Potomac River."

When the new fish laws were codified during the session of the General Assembly of 1929, the same restrictions were again placed in the Code and made part of the uniform fish laws of the State. It was not the intention in recodifying such laws to repeal any laws which tend toward conservation and it can not be said that the laws referred to above are not conservation measures. The hardship arises from the fact that we are curbing our own citizens and permitting Virginians to fish without the same restrictions. This, notwithstanding the fact that the rights which Virginians now enjoy were given to that state by Maryland under the Compact of 1785.

This is not intended to blame Virginia for this condition, as that state has always endeavored, through the legislation which she has passed since 1912 regulating oysters and crabs, to cooperate with this State along all such measures. The only way to remedy these particular grievances is for Maryland to withdraw her restrictions and allow her citizens the same rights as the citizens of Virginia, or have Virginia pass similar legislation to conform with our laws.

A better suggestion, perhaps, would be to change the Concurrent Law in such a way as to specifically bring the citizens of both states under the same law, which necessarily must include the seasons for fishing, sizes of nets and mesh, and sizes of fish. These are details to be worked out and it is not attempted here to say what the law should be, but anyone desiring fair play in the fishing operations of the Potomac River can not deny the need of uniform regulations.

OYSTER SALES INCREASE

Although the weather conditions during September, 1930, have been unfavorable to the oyster-packing business, it is surprising to note that there was an increase of 39 per cent. over the catch and sale of the packers during September, 1929.

TANGIER SOUND OYSTER-ROCK INSPECTION

SINCE THE BEGINNING of the oyster season, September 1, conflicting reports have been received at the office of the department relative to the condition of the oyster bars and rocks of Tangier Sound. The Commissioner determined to have a thorough investigation made, and directed the engineer, H. E. Collins, to take the police boat Somerset, with proper dredging equipment, and make a thorough inspection of the oyster areas in this region.

Following is the report submitted under date of October 11, 1930:

Fox Island Bar—In three hauls of the dredge we found four spat and two oysters. Plenty of clean shells but nothing indicating a catch.

Great Rock—Three hauls on various parts of this famous rock yielded no spat and six oysters. We dredged over the area where we planted more than 10,000 bushels of up-the-Bay oysters in 1928, and the six we found had the characteristics of these oysters. Shells are plentiful and clean.

Old Island Rock—No spat and the oysters we found (eight) had the characteristics of the up-to-Bay plants of 1928. Plenty of shells here, and clean ones, too.

Terrapin Sand—No spat and only two old oysters were found. Plenty of shells, all clean and in good catching condition.

Harris—In 1922, under the Commissioner's direction, about 30,000 bushels of shells were planted here. We tried them and found a few oysters that looked like they were a year old. No young growth visible. The upper part showed up better and would average one spat per shell found. All shells clean.

Chain Shoal—Here we found the only thing that looked like a catch in Tangier Sound. The shells are all clean and plentiful. The spat looked healthy and would average at least one per shell. Old oysters scarce.

Old Orchard—This bar has been barren for several years and we were surprised to find a fairly good catch on the outer edge. There also were some oysters that appeared to be about one year old. Plenty of shells in good condition.

Haines Point—From conditions on Chain Shoal and Old Orchard, we were confident we would find young growth on Haines Point. However, we were disappointed. This bar was planted under the department's direction in 1928, and it also received a few loads of shells this year. No young growth or oysters were found by us, though we tried a number of hauls. Crossing the Sound, we tried all the way down the westward side.

Mud Rock—This rock has been planted two years with seed stock from the head-of-the-Bay and this year it was planted with

shells. We tried various parts of it and a few spat were visible on the part not planted; also a few of the up-the-Bay oysters were caught. On this year's planting of shells there appears a catch of spat that will average about one to a shell.

Turtle Egg Island—In 1923, 50,000 bushels of shells were planted on this rock under your supervision. The shells appear clean, but no spat is visible anywhere we tried, and we tried all over them. Nor does there seem ever to have been a catch. No oysters and no young growth. Tried other parts of this very long bar, but no spat or oysters were caught.

Muscle Hole—This also is a long bar and we tried the upper end first with negligible results. Then we proceeded to the lower end where we planted over 10,000 bushels of shells in 1928 under the department's supervision. When we tried these shells in the fall of 1928, we found a catch which we called 25 per cent. These oysters apparently died. Found quite a few dead oysters that looked as though they might have lived to be a year old. Sand coral seems to have accumulated on these shells to such an extent that their power to catch spat is gone.

Deep Banks (Terrapin Sand Inner)—In 1927, the first year of the Advisory Board, Mr. Handy wanted to do something for Tangier Sound, so the Commissioner and he got together and sent to the seaside to get 25,000 bushels of shells. Mr. Handy got a committee from Smith's Island to select the spot on which these shells were to be planted, and they were put over about the first of August, 1927. Each year we have been back to look at them and have never seen the first spat. This year is no exception.

Effects Of The Screwborer—One factor we have not mentioned so far, and that is what we call the "screwborer." They are present throughout the length and breadth of Tangier Sound. We found some shells on which we counted nine spat with seven bored and two living. We also caught a lot of the borers themselves. It appears that these same borers are going to destroy what we found on Piney Island, Chain Shoal, and Old Orchard. It would seem that the borers have had as much to do with the extinction of Tangier Sound as an oyster-producing center as the overfishing of which we hear so much. Because of this condition, the problem of rehabilitation is no easy one.

In this report the engineer referred to the large number of spat killed by the screwborer and states that in some cases five out of seven spat had been destroyed in this manner. In the opinion of the U. S. Bureau of Fisheries, the presence of the screwborer in Tangier Sound in greater numbers than usual, is largely due to light precipitation and consequent high density of the water. Dr. Radcliffe, of the bureau, thought that when normal weather conditions return this oyster enemy will decrease materially in the Sound.

PROPOSED CHANGES IN FISH-LINE STAKES IN VIRGINIA WATERS

THE CONSERVATION DEPARTMENT has been very much concerned over a recent letter from the United States Engineer dealing with proposed changes in the fish-line stakes on both the westerly and easterly sides of Chesapeake Bay in Virginia waters. The following letter was sent to Judge Chinn, Virginia Commissioner of Fisheries, asking his cooperation in preventing the proposed extension of this line, which would still further limit the already narrow lane through which migratory fish have to pass in order to reach the spawning grounds in Maryland waters.

October 7, 1930.

JUDGE JOSEPH W. CHINN,
Commissioner of Fisheries,
Warsaw, Virginia.

MY DEAR JUDGE CHINN:

I understand that on October 10 there will be a hearing before the United States Engineer, at Newport News, Virginia, on the question of permitting fishermen to extend their pound-nets a greater distance out in the Chesapeake Bay between Smith's Point, at the southerly entrance to the Potomac River, and Windmill Point off the mouth of the Rappahannock River.

It would seem that if this change in the fishing regulations were permitted, it would conflict with the spirit of agreement made in 1924 by the Governors of Virginia and Maryland, and the Fishery Commissioners of the two commonwealths, which provided for better fishery protection in the waters of Chesapeake Bay and its tributaries.

The State of Virginia agreed to curtail the length of nets in order that the shad, herring, and other migratory fishes might pass up the Chesapeake, seeking spawning grounds in the tributaries of the upper Chesapeake; while Maryland agreed to reduce the number of fishing nets and gear in these waters in order to give the fish a better chance on the spawning grounds.

Since this agreement, the State of Maryland has greatly increased its shad-hatchery work from 2,500,000 to 15,000,000 shad a year; likewise a greater increase in the herring, and this State is making every effort to further improve these conditions on the spawning ground.

I trust that this proposed extension will not be permitted, as it is decidedly against conservation of the fishery interests in the waters of Chesapeake Bay.

Very truly yours,

(Signed) SWEPSON EARLE,
Commissioner.

Both Senator Tydings and Representative Linthicum, of Maryland, have written to the United States Engineer, backing the department in its effort to have the lines remain as they are at present. It is contended by the department that fish coming into the upper Chesapeake for spawning are at present greatly hampered, and the extension of any nets, narrowing their channel, could not be looked upon with favor by conservationists.

In 1924, it was agreed by the Conservation Commissioner of Maryland and the Commissioner of Fisheries of Virginia that nets in Virginia waters would not be increased in length and their numbers would be curtailed as much as possible in order that fish seeking the spawning grounds would be given a chance to do so. Maryland carried out her agreement to clear the spawning grounds of nets so that the fish after reaching this area would be unmolested. The shad is a striking example of migratory fish requiring this protection.

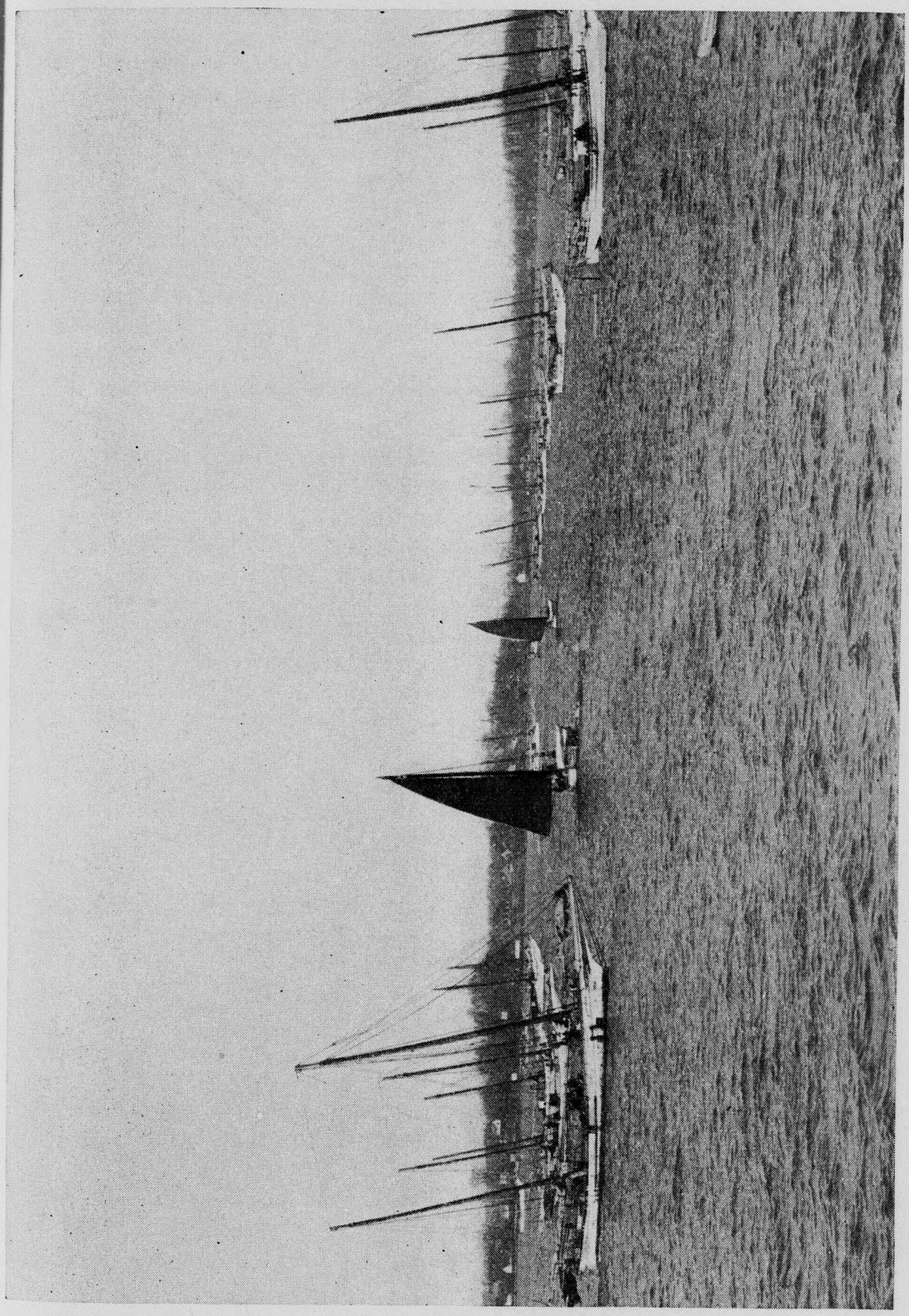
The United States Bureau of Fisheries maintains a large shad hatchery on the upper Potomac River, and it must depend upon the fish getting through from the lower Bay in order to supply the station with eggs for hatching.

While the department has received no definite assurance from the United States Engineer's office that they will act on its recommendations, it is understood that there will be some modification in the proposed changes so as to least affect the migratory fishes of the Chesapeake.

NEW PUBLICATIONS

The Bureau of Fisheries will publish shortly a document entitled: "Fish-Meal in Animal Feeding, with Bibliography," by John Ruel Manning, technologist of the U. S. Bureau of Fisheries. When issued, this publication may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a very nominal price; and in quantity it may be secured at a reduced rate.

This document should be of interest, not only to persons in the fishery industries and producers of fish-meals and shell-fish meals, but also to biochemists and other research workers in this field, and to animal feeders and those interested in animal nutrition in general. It contains as complete a biblography as could be assembled, together with non-critical comments and abstracts of the references contained therein. The general nutritive properties of fish-meal are discussed in detail. The results of experimental feeding of farm animals, as well as the work done with laboratory animals, are included in this document. The methods of feeding fish-meal, and the proportions or percentages of fish-meal in the rations of various farm animals, recommended by the best authorities, and many other principles of practice of vital interest to the farmer are set forth.



Part of Dredging Fleet Making Harbor to Dispose of Day's Catch

Both Senator Tydings and Representative Linthicum, of Maryland, have written to the United States Engineer, backing the department in its effort to have the lines remain as they are at present. It is contended by the department that fish coming into the upper Chesapeake for spawning are at present greatly hampered, and the extension of any nets, narrowing their channel, could not be looked upon with favor by conservationists.

In 1924, it was agreed by the Conservation Commissioner of Maryland and the Commissioner of Fisheries of Virginia that nets in Virginia waters would not be increased in length and their numbers would be curtailed as much as possible in order that fish seeking the spawning grounds would be given a chance to do so. Maryland carried out her agreement to clear the spawning grounds of nets so that the fish after reaching this area would be unmolested. The shad is a striking example of migratory fish requiring this protection.

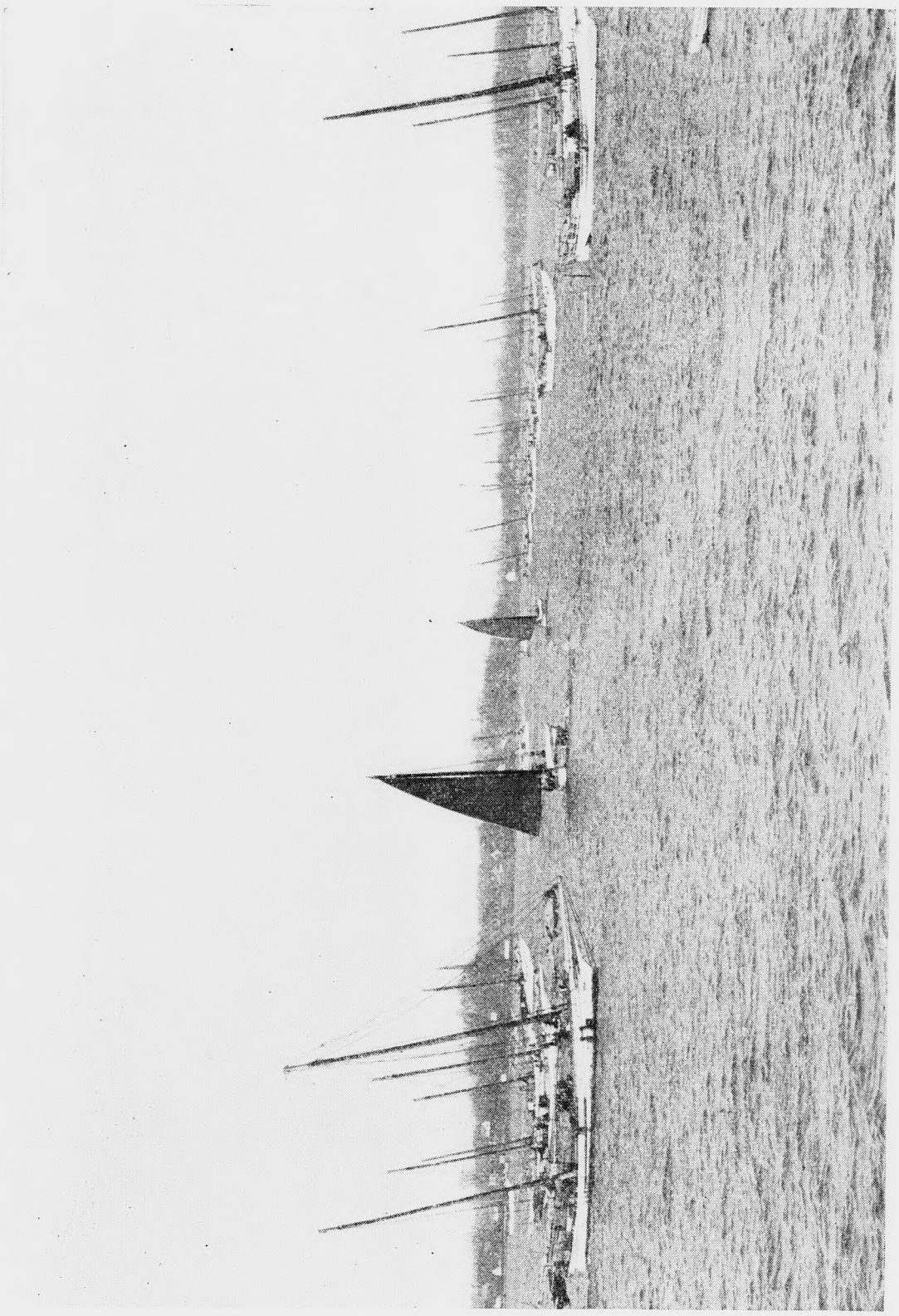
The United States Bureau of Fisheries maintains a large shad hatchery on the upper Potomac River, and it must depend upon the fish getting through from the lower Bay in order to supply the station with eggs for hatching.

While the department has received no definite assurance from the United States Engineer's office that they will act on its recommendations, it is understood that there will be some modification in the proposed changes so as to least affect the migratory fishes of the Chesapeake.

NEW PUBLICATIONS

The Bureau of Fisheries will publish shortly a document entitled: "Fish-Meal in Animal Feeding, with Bibliography," by John Ruel Manning, technologist of the U. S. Bureau of Fisheries. When issued, this publication may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a very nominal price; and in quantity it may be secured at a reduced rate.

This document should be of interest, not only to persons in the fishery industries and producers of fish-meals and shell-fish meals, but also to biochemists and other research workers in this field, and to animal feeders and those interested in animal nutrition in general. It contains as complete a biblography as could be assembled, together with non-critical comments and abstracts of the references contained therein. The general nutritive properties of fish-meal are discussed in detail. The results of experimental feeding of farm animals, as well as the work done with laboratory animals, are included in this document. The methods of feeding fish-meal, and the proportions or percentages of fish-meal in the rations of various farm animals, recommended by the best authorities, and many other principles of practice of vital interest to the farmer are set forth.



Part of Dredging Fleet Making Harbor to Dispose of Day's Catch

MARYLAND FISHERIES

516 MUNSEY BUILDING BALTIMORE, MARYLAND

PUBLISHED BIMONTHLY BY CONSERVATION DEPARTMENT,
SWEPSON EARLE, Commissioner.

No. 7 NOVEMBER, 1930

[*This publication presents the views and policies of the Conservation Dept.*]

THE POTOMAC RIVER PROBLEM

On page 1 of this issue of the MARYLAND FISHERIES is an article dealing with equal fishery rights for the Potomac River and advocating uniform regulations for the citizens of Maryland and Virginia.

It is distressing that this noble tributary of the Chesapeake has been permitted to be stripped of its valuable fisheries until, today, the oyster bars are depleted almost beyond commercial use. This condition was found to exist by a survey made by the United States Bureau of Fisheries in cooperation with the States of Maryland and Virginia and published in the department's 1928 annual report. Migratory fin fish have likewise been reduced in quantities, due to lack of proper net regulations.

It would seem that the two commonwealths having control of the fisheries of this important river would use it wisely, in order to preserve the natural wealth it contains for their citizens. This, unfortunately, has not been the case.

The Compact of 1785, entered into by the States of Virginia and Maryland, gave equal right of fishery to citizens of both, but uniform police regulations were not agreed upon until after a lapse of 127 years. In the meantime the watermen of both states used the Potomac as a free hunting ground.

It would be difficult to estimate the value of the fisheries produced by the Potomac during this period. In 1912, the late Colonel W. McDonald Lee, then Commissioner of Fisheries of Virginia, valued them, even at that late date, at $1,000,000 a year. Maryland has counted on the Potomac to furnish one-quarter of all the dredged oysters produced within the State, and the falloff in her production in recent years may be attributed largely to the depleted condition of the bars of this river.

The two states cannot afford to delay the work of rehabilitation any longer. The handling of the Potomac situation may be expedited by a commission, among whose members would be the Commissioners of Fisheries of both states. Governor Ritchie is

strongly in favor of Maryland and Virginia cooperating to increase the oyster industry on the natural rocks, and the Potomac offers an excellent opportunity to put this into effect.

In the article above referred to, the differences in the fishery laws now administered by the two commonwealths are discussed, and no time should be lost to have these made uniform. Virginia, at the last session of her General Assembly, concurred in a number of laws passed by Maryland, notably the law to increase the legal size of oysters to three inches and the law to prevent the use of drift-nets to take striped bass in winter, when they are hibernating in the deep waters of the Potomac. The oyster regulations of the two states are now practically uniform, and, by adjusting the fishing regulations, policing will be simplified and we may expect good results to quickly follow.

The recently appointed Commissioner of Fisheries of Virginia, Judge Joseph W. Chinn, is showing a keen interest in the Potomac River and has indicated that he realizes concerted action should be taken by the two states with as little delay as possible.

The Potomac River, even in the past 15 years, has supported the entire Bay-dredging fleet during the fall months, and this fleet numbered some 400 vessels. There is no reason why the oyster bars cannot again be made to yield a sufficient number of oysters to double Maryland's present production and at the same time give employment to many more watermen than at present.

SAVING THE SPAT

The work which the department is endeavoring to do at this time to save the young growth attached to oysters when sold to the packing-houses will go a long way towards increasing the oyster supply. There is no question that many thousands of bushels of oysters have been lost in the past by dying on the shell pile, when they might have been placed overboard in a short time after shucking when the weather conditions permit.

The Commissioner found on a number of shell piles in lower St. Mary's County on an inspection trip a few years ago, quantities of young growth which, if returned to the beds, wou'd have matured into marketable oysters within two years. This is practically the same as planting seed on the natural bars, which is so necessary a part of the rehabilitation of the depleted oyster rocks.

CAUTION TO HUNTERS

With the hunting season on in Maryland and the very dry weather, the Conservation Commissioner wishes to impress upon the sportsmen of the State the necessity of great care to prevent the starting of forest fires.

The upland huntsman, especially, must realize that the freshwater streams of the State are the home of the trout and other

game-fish, and, in order to protect these streams from the hot suns during the summer and to give them a uniform temperature, the streams must be wooded. Foliage is most essential and the overhanging branches give this uniform temperature to the mountain streams, which is demanded for successful trout propagation, as well as for water supply.

A forest fire started along one of these streams would soon strip it of its wooded protection which the Conservation Department is endeavoring to conserve along the streams in the State.

SAVING YOUNG GROWTH ON SHELLS

The reports of deputy commanders and inspectors after the opening of the oyster season indicated the presence of spat in large quantities in certain tributaries of the Bay, notably, Smith Creek and St. Mary's River on the Western Shore, and Honga River and Tar Bay on the Eastern Shore. The catch in these waters was unusually heavy, and as the season advanced the shells planted by the department during the early summer were found to be almost covered with young growth.

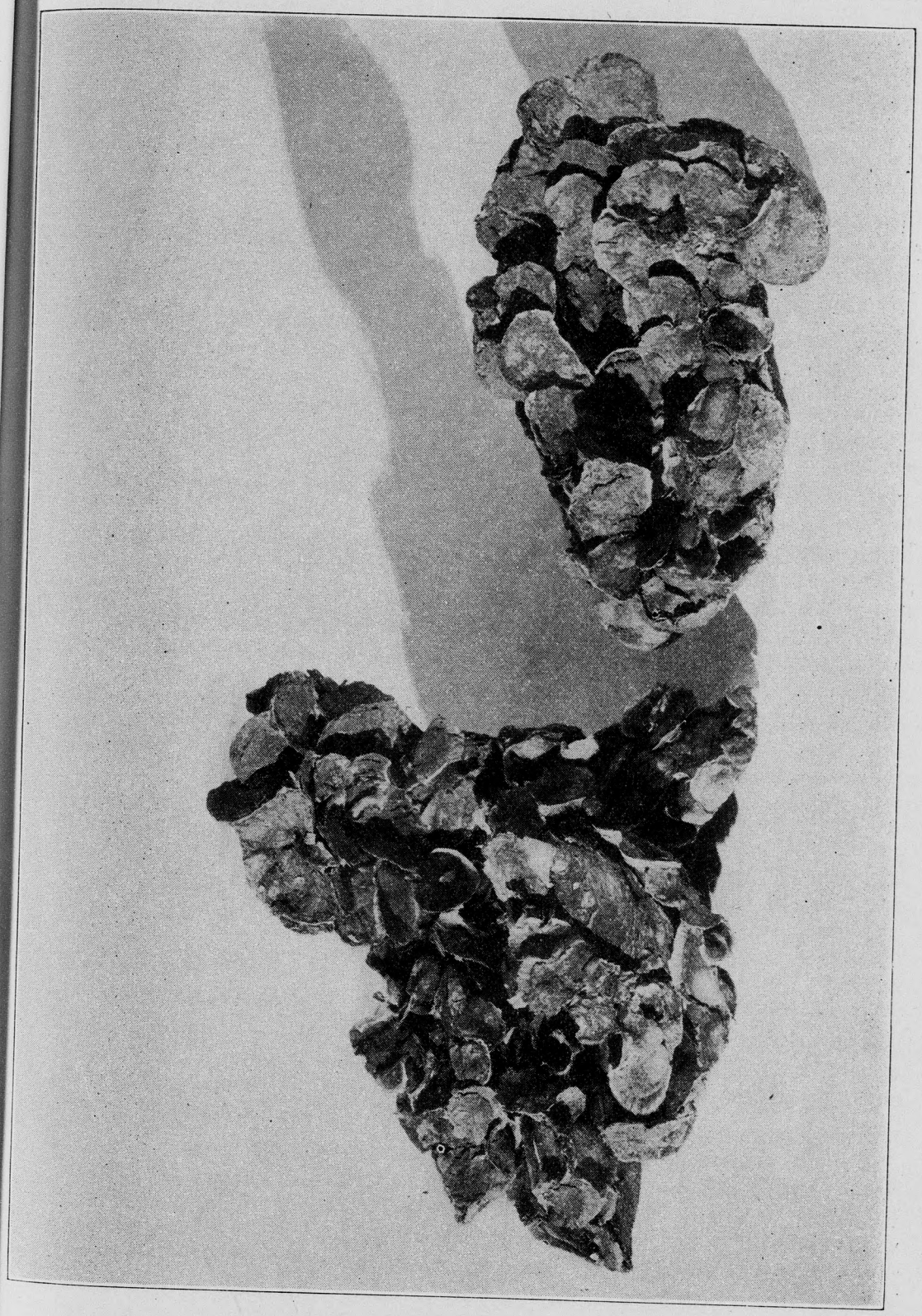
The department in the past has endeavored to save the young growth attached to oysters whenever possible by arranging with the shucking-houses for the purchase of these shells and placing them overboard at once after shucking, so that the young oysters would be alive when thrown back into the waters.

At a meeting of the Advisory Committee held in Baltimore in October this matter was discussed, and Mr. John T. Handy, representing the lower district of the Eastern Shore, arranged to look out for oysters coming to Crisfield from the Potomac River district, in order that the young growth might be saved by returning it to the bottoms. Mr. Robert Harrison and Captain Woodfield will do likewise in their respective districts. The chief deputy commander was directed to go to Honga River and arrange with the packing-houses in that district for the placing overboard of shells containing spat.

HIGH DENSITY BLAMED FOR FISH MORTALITY

Considerable mortality of fish occurred in certain rivers of Maryland, especially the Magothy and upper Severn, during the first two weeks in November. The Conservation Department, in doubt as to the cause, began a careful investigation, and, according to the best information available, the high salt content of these waters (due to the long drought) is to blame. Fish found dead are mainly fresh-water species, such as pike and yellow perch. No salt-water varieties seem to have been affected.

The waters flowing into the Magothy and Severn do not drain as great an area as most tributaries of the Chesapeake, which contributes to the high density of these streams. However, if the drought continues, fish mortality may be expected in other waters of the State.



Result of Spat Catch in St. Mary's County, 1930—Two Oysters and One Shell Contain 120 Young Oysters.

game-fish, and, in order to protect these streams from the hot suns during the summer and to give them a uniform temperature, the streams must be wooded. Foliage is most essential and the overhanging branches give this uniform temperature to the mountain streams, which is demanded for successful trout propagation, as well as for water supply.

A forest fire started along one of these streams would soon strip it of its wooded protection which the Conservation Department is endeavoring to conserve along the streams in the State.

SAVING YOUNG GROWTH ON SHELLS

The reports of deputy commanders and inspectors after the opening of the oyster season indicated the presence of spat in large quantities in certain tributaries of the Bay, notably, Smith Creek and St. Mary's River on the Western Shore, and Honga River and Tar Bay on the Eastern Shore. The catch in these waters was unusually heavy, and as the season advanced the shells planted by the department during the early summer were found to be almost covered with young growth.

The department in the past has endeavored to save the young growth attached to oysters whenever possible by arranging with the shucking-houses for the purchase of these shells and placing them overboard at once after shucking, so that the young oysters would be alive when thrown back into the waters.

At a meeting of the Advisory Committee held in Baltimore in October this matter was discussed, and Mr. John T. Handy, representing the lower district of the Eastern Shore, arranged to look out for oysters coming to Crisfield from the Potomac River district, in order that the young growth might be saved by returning it to the bottoms. Mr. Robert Harrison and Captain Woodfield will do likewise in their respective districts. The chief deputy commander was directed to go to Honga River and arrange with the packing-houses in that district for the placing overboard of shells containing spat.

HIGH DENSITY BLAMED FOR FISH MORTALITY

Considerable mortality of fish occurred in certain rivers of Maryland, especially the Magothy and upper Severn, during the first two weeks in November. The Conservation Department, in doubt as to the cause, began a careful investigation, and, according to the best information available, the high salt content of these waters (due to the long drought) is to blame. Fish found dead are mainly fresh-water species, such as pike and yellow perch. No salt-water varieties seem to have been affected.

The waters flowing into the Magothy and Severn do not drain as great an area as most tributaries of the Chesapeake, which contributes to the high density of these streams. However, if the drought continues, fish mortality may be expected in other waters of the State.

Result of Spat Catch in St. Mary's County, 1930—Two Oysters and One Shell Contain 120 Young Oysters.

FACTORS AFFECTING THE MARKET FOR FRESH OYSTERS AND RELATED CONSIDERATIONS IN FOURTEEN CITIES OF THE UNITED STATES

By J. M. LEMON, *Associate Fisheries Technologist, U. S. Bureau of Fisheries.*

[Editor's Note: The following article, which is part of a paper read by Mr. Lemon at the joint convention of the National Association of Shell Fish Commissioners and Oyster Growers and Dealers' Association of North America, at Sayville, Long Island, in August of this year, gives the results of a personal canvass conducted by the Bureau of Fisheries among housewives and dealers selected at random in the following cities: Washington, Baltimore, Denver, Oklahoma City, Kansas City, Des Moines, St. Paul, St. Louis, Chicago, Buffalo, Columbus, Chattanooga, Birmingham, and Atlanta. The survey was made to determine the reaction of the public towards oysters as a food. The results are interesting.]

ACCORDING to most recent statistics (1928) there are 155,824,000 pounds of oysters (meats) valued at $16,825,000 harvested in the United States annually. These statistics indicate that the oyster fishery is second in value to the fisherman and fifth in volume of catch of edible sea foods. The oyster is found in every seacoast state of the country, and a commercial fishery is conducted in every one of these states, except Maine and New Hampshire. The food value of the oyster harvest is equivalent to 272,000 dressed steers* and is sufficient to supply each man, woman, and child in the nation with 1 1/3 pounds each year.

Problems relative to the propagation and maintenance of our oyster supply have been studied with such success that the practice of farming this sea food is becoming better organized. In some areas the crops are now planted and harvested in very much the same scientific manner as that used by the agriculturist in planting and harvesting his crops from the soil. The U. S. Bureau of Fisheries, various state fishery agencies, and associations of oyster producers maintain laboratories and staffs of scientists for the study of the problems confronting the oyster fishery. As a result, the biology and chemistry, as well as the diseases and enemies of the oyster, are now becoming quite thoroughly understood.

One problem confronting the oyster industry which has not been studied to any great extent is that of marketing the catch. In order to gain information relative to this problem, this survey was conducted by the Bureau of Fisheries in cooperation with the Oyster Growers and Dealers' Association of North America, Incorporated, and various state officials. An effort was made to determine the reaction of the public toward oysters as a food.

* Based on Department of Agriculture Farmers' Bulletin No. 1383, March, 1923, p. 23.

The information was obtained by personally interviewing 127 dealers and 1,393 housewives in 14 cities of the country.

After a conference with oyster producers, the following cities were selected for the survey: Washington, Baltimore, Denver, Oklahoma City, Kansas City, Des Moines, St. Paul, St. Louis, Chicago, Buffalo, Columbus, Chattanooga, Birmingham, and Atlanta.

These cities are so situated that they are in widely separated sections of that portion of the country east of the Rocky Mountains, the composition of the population differing somewhat in each city, and the economic structure of each city varying according to the location.

MARKET FOR FRESH OYSTERS

Findings

It has been found that:

1. About one-half of the housewives interviewed read newspapers for menu suggestions.

2. About one-half of the housewives interviewed desired to purchase oysters by brand.

3. In cities where oysters were obtainable in convenient unit packages as packed at the point of production, about one-half of the housewives desired to purchase them in this manner.

4. About one-fifth of the housewives interviewed had a mechanical refrigerator.

5. Of the housewives interviewed who purchased oysters, three-fourths did so because they liked their taste; about one-third because they considered them high in food value, and about one-fourth because they found them easy to cook.

6. Of the housewives interviewed who did not purchase oysters, one-eighth stated as their reason that they did not like their taste.

7. Practically nine-tenths of the housewives interviewed served oysters in their household at least once a season; about one-fourth, once a week, and about one-fifth, once a month.

8. About one-half of the housewives interviewed reported that oysters were served in their household most frequently in the form of a stew. About two-fifths of them served oysters fried.

9. Over three-fourths of the housewives interviewed served oysters generally at dinner.

10. The per capita consumption of oysters in the cities surveyed averaged 4.2 pounds annually.

11. About one-half of the housewives interviewed believed that consumption of oysters could be increased by lowering the retail price, while about one-third believed this could be consummated by advertising the merits of oysters.

12. In all cities visited, about one-fifth of the dealers marketing oysters sold them in unit packages as packed at the production points.

13. Purchasers almost always asked for oysters according to size, the most popular size asked for being the "medium."

14. Only about one-fifth of the purchasers of oysters asked for them by brand.

15. Less than one-tenth of the purchasers of oysters asked for them according to kind, such as "Bluepoint," "Lynnhaven," etc.

16. Nearly one-half of the retailers displayed shucked oysters in glass jars. Other popular methods were in stone jars, in buckets, in pails, in porcelain pans, in unit packages as packed at the production point, and in specially constructed display cabinets.

17. The largest daily sale of oysters during the week were made on Friday; the smallest on Monday.

18. The largest monthly sales during the oyster season were made in Dec. and Jan.; the smallest, in Sept. and April.

19. Shucked oysters were sold at retail usually in units of one pint, nearly four-fifths of the dealers reported.

20. The average retail prices of oysters were: 23 cents per one-half pint, 45 cents per pint, 86 cents per quart, $3.08 per gallon; and by the dozen, in the shell, 26 cents.

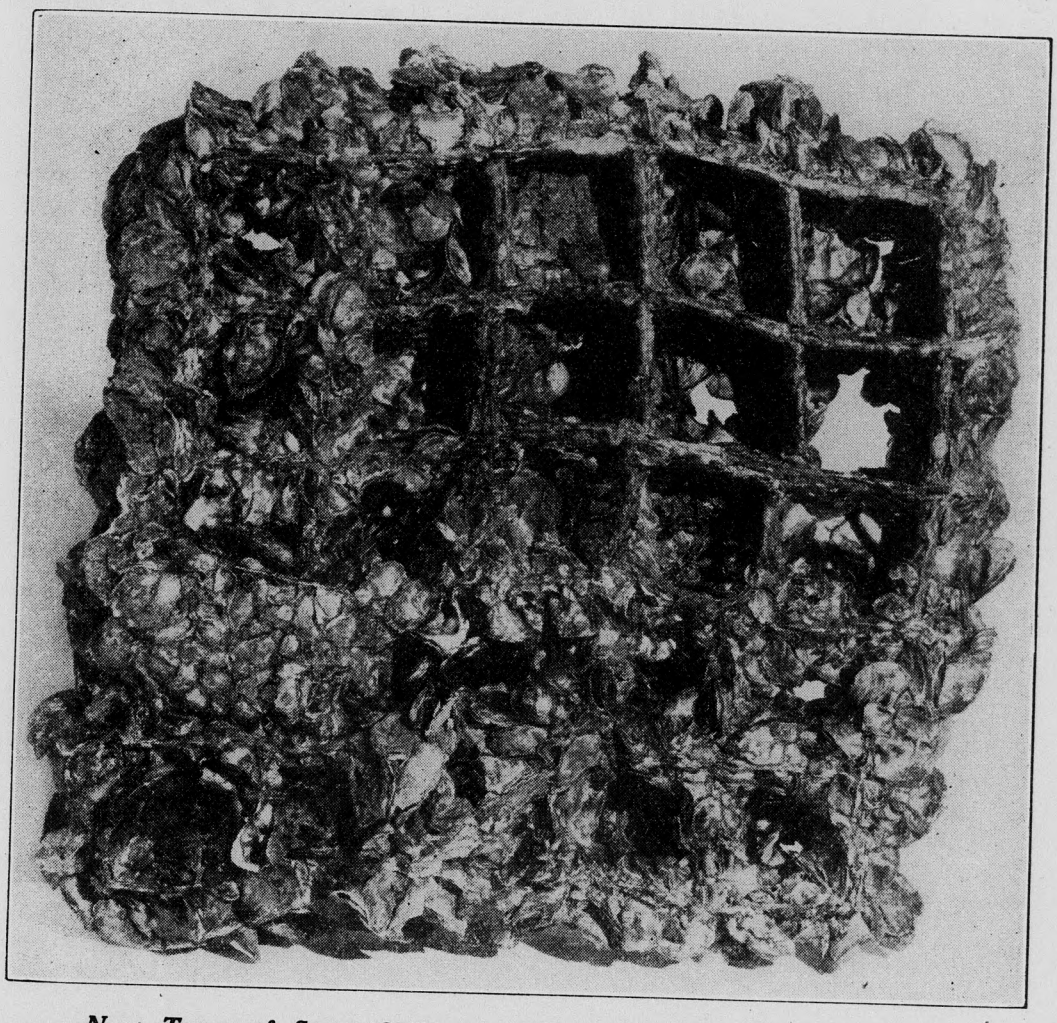
21. What advertising was done by dealers was usually conducted in newspapers.

THE SEED-OYSTER QUESTION

INVESTIGATIONS made by Dr. R. V. Truitt, of the Marine Laboratory, during the past two years have demonstrated the fact that certain localities are particularly adapted for seed-oyster culture; notably, Tar Bay and Honga River in Dorchester County. Following experiments made by the U. S. Bureau of Fisheries with cement-covered egg-crate partitions for the collection of spat, the Conservation Department during the past summer purchased 2,000 of these cardboard partitions and, after being properly treated at the Marine Laboratory, under the direction of Dr. Truitt, they were placed overboard in a number of localities during the spawning season. Some of these seed col-

lectors were given to oyster planters in Maryland who desired to experiment with them.

While Tar Bay had a phenomenal catch of spat on oyster shells, faggots, old duck blinds and even the bottoms of boats, the egg-crate seed collectors taken from this bay showed an amazing catch, being literally covered with young oysters. The photograph below shows one of these seed collectors covered with spat, and Dr. Truitt estimates that it contains 3,500 young



New Type of Spat Collector Showing Remarkable Catch

oysters. These oysters, if properly separated and spread over suitable growing bottoms, when matured would fill ten barrels, or a sufficient number of oysters to feed several hundred persons. This is a practical and inexpensive type of spat collector which may be extensively used in the future by planters and even the State.

11. About one-half of the housewives interviewed believed that consumption of oysters could be increased by lowering the retail price, while about one-third believed this could be consummated by advertising the merits of oysters.

12. In all cities visited, about one-fifth of the dealers marketing oysters sold them in unit packages as packed at the production points.

13. Purchasers almost always asked for oysters according to size, the most popular size asked for being the "medium."

14. Only about one-fifth of the purchasers of oysters asked for them by brand.

15. Less than one-tenth of the purchasers of oysters asked for them according to kind, such as "Bluepoint," "Lynnhaven," etc.

16. Nearly one-half of the retailers displayed shucked oysters in glass jars. Other popular methods were in stone jars, in buckets, in pails, in porcelain pans, in unit packages as packed at the production point, and in specially constructed display cabinets.

17. The largest daily sale of oysters during the week were made on Friday; the smallest on Monday.

18. The largest monthly sales during the oyster season were made in Dec. and Jan.; the smallest, in Sept. and April.

19. Shucked oysters were sold at retail usually in units of one pint, nearly four-fifths of the dealers reported.

20. The average retail prices of oysters were: 23 cents per one-half pint, 45 cents per pint, 86 cents per quart, $3.08 per gallon; and by the dozen, in the shell, 26 cents.

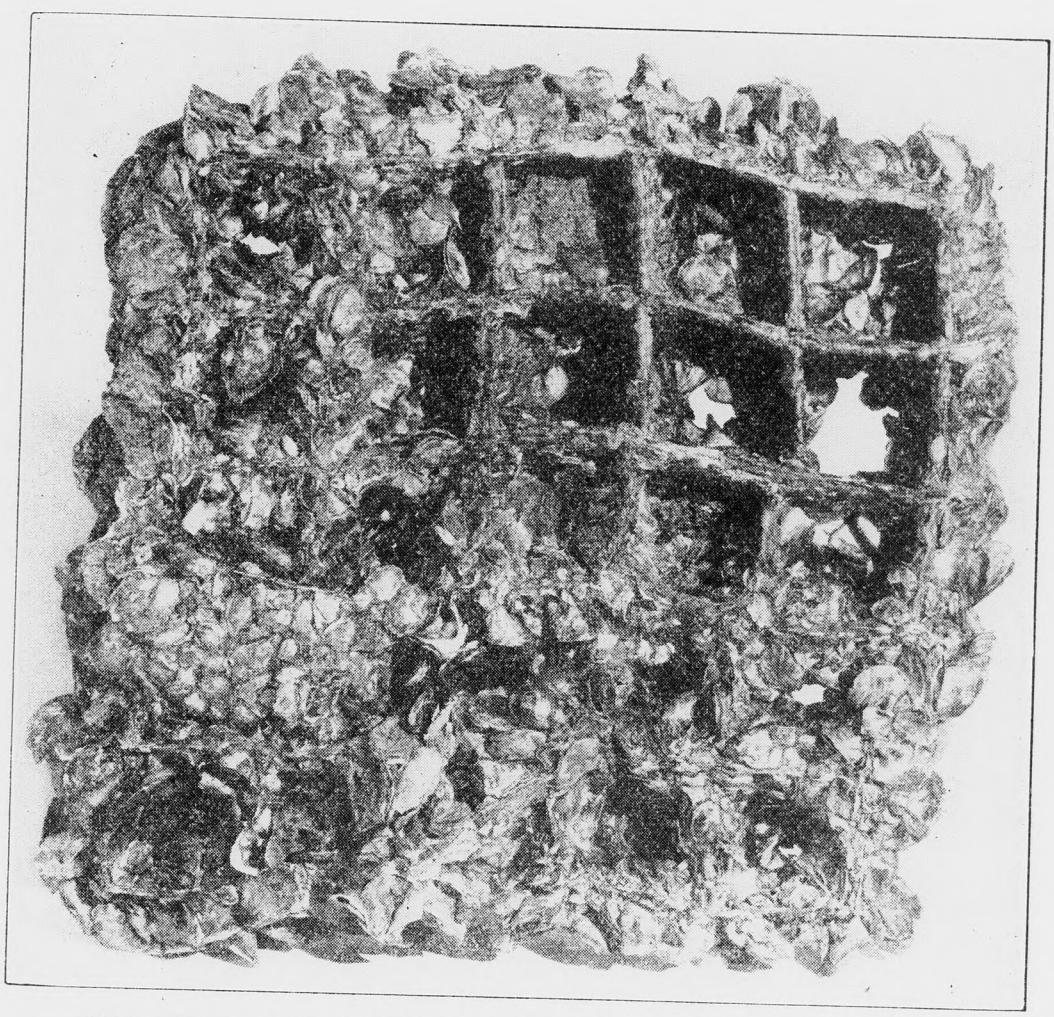
21. What advertising was done by dealers was usually conducted in newspapers.

THE SEED-OYSTER QUESTION

INVESTIGATIONS made by Dr. R. V. Truitt, of the Marine Laboratory, during the past two years have demonstrated the fact that certain localities are particularly adapted for seed-oyster culture; notably, Tar Bay and Honga River in Dorchester County. Following experiments made by the U. S. Bureau of Fisheries with cement-covered egg-crate partitions for the collection of spat, the Conservation Department during the past summer purchased 2,000 of these cardboard partitions and, after being properly treated at the Marine Laboratory, under the direction of Dr. Truitt, they were placed overboard in a number of localities during the spawning season. Some of these seed col-

lectors were given to oyster planters in Maryland who desired to experiment with them.

While Tar Bay had a phenomenal catch of spat on oyster shells, faggots, old duck blinds and even the bottoms of boats, the egg-crate seed collectors taken from this bay showed an amazing catch, being literally covered with young oysters. The photograph below shows one of these seed collectors covered with spat, and Dr. Truitt estimates that it contains 3,500 young



New Type of Spat Collector Showing Remarkable Catch

oysters. These oysters, if properly separated and spread over suitable growing bottoms, when matured would fill ten barrels, or a sufficient number of oysters to feed several hundred persons. This is a practical and inexpensive type of spat collector which may be extensively used in the future by planters and even the State.

BIG POOL

MORE than a year ago the Hagerstown Chapter of the Izaak Walton League prevailed upon the Conservation Department to visit the site of Big Pool, located on the old Chesapeake and Ohio Canal, approximately 10 miles from the county-seat of Washington County, with a view of establishing a bass propagation station there. This body of water proved so attractive to the Commissioner that he directed the Superintendent of Fish Hatcheries, A. M. Powell, to make a survey and report. The result of this survey was most encouraging and the department at once started negotiations with Mr. G. L. Nicholson, manager of the canal company, to see what rights the State would have if it spent certain sums of money which were necessary to put the lake in shape for bass culture. Mr. Nicholson visited Baltimore for a conference on the subject and was very agreeable to the undertaking. He stated, however, that he would have to have the approval of the company before he could give us written authority to start the necessary work.

It so happened that the treasurer of the canal company went to Europe and the matter hung fire until his return in September, at which time the Commissioner renewed negotiations with the company in order that work might be begun without further delay.

On November 1, Mr. Powell again visited Big Pool to see the conditions there, following the long drought, and to his surprise he found large holes in the bottom of the pool from 6 to 50 feet in diameter and these openings caused an outlet directly into the Potomac River. Mr. Powell at once made a report, which is herewith quoted:

"Several days ago I visited Big Pool to see the conditions due to the drought in that section, and found the lake had drained to such an extent that it was only a few hundred feet in area and not more than six feet in depth at its deepest point. The unusual reduction in the water area is due to the bottom falling in and leaving an outlet to the Potomac River several thousand feet away. The largest hole was 50 feet in diameter and 25 feet deep, and there were three others approximately six feet in diameter and 10 feet deep. These holes are kept filled in by the canal company.

"I talked to the superintendent of that division and he tells me these holes are falling in constantly, and when the canal company was in operation dirt had to be hauled there on scows and barges and dumped to keep the holes filled.

"I also saw that it will be almost impossible to completely drain this lake, owing to the depressions, which are of considerable size. However, the main body or pool can be drained in accordance with our survey.

"After seeing the character of the bottom, which has little decayed vegetable matter and no aquatic plant life, I cannot see where you will be justified in spending any time or money in putting in an outlet to operate the lake.

"I do think you can operate Big Pool as a fishing preserve by having the privilege of closing the locks and filling it, and then stocking with large-mouth bass and crappie and closing it to the public for several years. I feel you will have better success in this way than using it as a rearing station for small-mouth bass."

This report has been submitted to both Dr. Lewis Radcliffe, deputy U. S. Commissioner of Fisheries, and Mr. Glenn C. Leach, in charge of the division of fish culture at the Bureau of Fisheries, and these men are both of the opinion that it would be impracticable, under the circumstances, to use Big Pool for small-mouth-bass culture as was proposed by the Conservation Department. Mr. Leach stated, however, that Big Pool could be operated as a fishing preserve in accordance with recommendation of Superintendent Powell, and the department will endeavor to carry out this suggestion.

The Bureau of Fisheries will advise further on the next best location in Western Maryland for the propagation of small-mouth black bass, as the department is earnest in its desire to turn out a greater supply of these fine game-fish for stocking such streams in the State as will support them.

HAND-SCRAPING AT NIGHT

One of the most serious violations in the tributary waters is hand-scraping at night. This, of course, is not new. It has been going on for years, but it is extremely difficult to cope with. The violators use fast power-boats and work under cover of darkness.

In the Potomac River, which is used concurrently with Virginia, hand-scraping has been harder to deal with than elsewhere. However, with the aid of the Commissioner of Fisheries of Virginia, seven hand-scrapers were recently apprehended on the Virginia side, while working on Ragged Point, and convicted.

The Maryland Commissioner has issued a special letter to all officials of the State Fishery Force to patrol their beats at night in an effort to put down these violations. To better protect the young growth, which is abundant in many localities, additional inspectors have also been placed on duty.

MARYLAND FISH PRODUCTION LAUDED BY GOVERNMENT EXPERT

At the annual meeting of the Baltimore Chapter of the Izaak Walton League, which took place on November 13, Mr. Glenn C. Leach, in charge of the division of fish culture of the U. S. Bureau of Fisheries, was one of the principal speakers. Mr. Leach, in discussing a country-wide campaign which the Bureau of Fisheries is starting to instruct farmers in fish propagation, commended the work which is being carried on by the Conservation Department of Maryland in the production of large quantities of fish by the State's hatcheries for distribution into public waters for the benefit of fishermen. The country's fish hatcheries, as a whole, Mr. Leach stated, do not produce enough fish to supply the sportsmen's demand.

FAIRLEE BASS STATION

The Conservation Department is very much gratified at the results obtained up to the present time at the State's new bass lake at Fairlee, Kent County. This project was completed last January and brood fish placed there in the early spring.

As a result of this year's spawning, more than 50,000 crappie ranging from four to four and a half inches in length were taken from the lake during the recent drawing down of the water supply. These fish have been distributed in Conowingo Pool and other waters of the Eastern Shore, and it is likely that between five and six thousand pike and a large number of black bass will be taken from the lake before operations are completed. The number of bass which will be available for distribution is not definitely known at this time, due to the fact that they remained in the upper waters of the lake and did not come near the screen gate like the crappie and pike. However, a good supply is anticipated, as large numbers have been seen in the lake.

The fish are removed by means of seines after the water supply is lowered, and are transported in special fish cans by motor trucks to suitable public waters.

The following distribution of fish was made under the direction of the Superintendent of Hatcheries, A. M. Powell, between January 1, 1930, and November 15, 1930. Distribution will not be completed before December 15, 1930:

Anne Arundel County—600 adult brook-trout.

Baltimore County—500 adult brook-trout.

Carroll County—3,000 small-mouth bass, 3 to 5 inches; 9,900 crappie, 4 inches.

Cecil County—3,000 large-mouth bass, 3 inches.

Conowingo Lake—9,900 crappie, 4 inches; 3,000 large-mouth bass, 3 inches.

Frederick County—5,427 adult brook-trout; 340 small-mouth bass, 3 to 5 inches.

Garrett County—1,440 adult brook-trout.

Queen Anne's County—19,800 crappie, 3 to 4 inches; 3,200 large-mouth bass, 3 inches.

Talbot County—3,200 large-mouth bass; 1,000 crappie.

Washington County—3,360 adult brook-trout.